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Determınatıon of Qualıty Indıcators of Basıc Feed Crops Belongıng to A Varıety of Herbs ın Summer Pastures

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The article provides information on the nutritional value of various herbs, collected from the north-eastern regions of Lesser Caucasus Azerbaijan and summer pastures of Talish region (Masally, Lankaran and Yardimli). Studies have shown that, vitamin "C" is mainly observed in representatives of Rosaceae (6-44%). It is relatively less in the representatives of other families (2-9%). The chemical composition of the fodder herbs belonging to various herb groups is calculated based on the absolute dry mass. In the flowering phase of plants, the amount of ash protein, proteins, lubricants and insecticides in various organs was studied and their nutritional value was determined on that basis.

Keywords: *Summer pastures, fodder crops, chemical composition*

INTRODUCTION

In connection with the development of civilization ecological condition changes gradually and various negative circumstances arise everywhere in the world. In this case actual problems emerge, such as the rise of the photosynthetic coefficient, the high productivity of soil for the full provision of the population with valuable food products caused by drought, energy, efficacious effect of active irradiation (Batisse, 2001). Taking into account that the development of livestock is not possible without balanced feed and the main part of human nutrition is animalistic nutrition, then it would be challenging to estimate the importance of plants. One of the actual issues is protein problem (Eryashev, 2003). Plants are considered to be the source of protein up to now. Traditional high-rise cultivated plants are mainly representatives of the legume family and great work is being done through the increase of their productivity (Lavrenko, 1995). But this cannot fully satisfy the protein as well. Therefore, we have reviewed several representatives of the families in order to search for new sources.

The main purpose of this research is to define chemical composition and economic indices of the valuable species of summer pastures in a complex way, and at the same time to identify more promising ones, defining types of high nutritional value on their basis.

MATERIALS AND METHODS

The research was carried out in 2017-2018. The plants were collected mainly from the Shahbuz region of the Autonomous Republic of Nakhchivan, the northern regions of the Lesser Caucasus and the Talish summer pastures (Masalli, Lankaran and Yardimli). The nutritional value and chemical composition of the fodder plants that are important in feeding animals and grown in summer pastures were investigated (Lidzhiyeva et. al, 2005). Feeding quality of the raw materials of the plants collected from different regions of Azerbaijan was tested. Assessment of feeding quality of plants, fractional structure of phytocturity, chemical composition of nitrogen, ash element, surface phytocturity and other analyses were carried out according to commonly accepted methods (under publication, 1982). The essential oil of fragrant plants has been studied by the Qinzberg method (Goryayev et. al., 1962). Greasy acids and vitamin C have been obtained from some of the major types of feeding according to the methods (Yermakov et al., 1972). For the determination of vitamin C leaf, stem and seed samples were cut in the porcelain dish or glass plate using stainless or chrome plated knife. Taking into account that iron traces, especially copper, accelerate the destruction of vitamin C, the process should be carried out very fast. As the average sample (if the plant is large) is 10-15 copies, a certain part should be taken so that all the tissue parts of the given object are included in this section. For example, one from the main part to the top (end) part, and the other one perpendicular to the first cut. The obtained tissues should be quickly cut in the porcelain dish and mixed. The whole or half of the average-size leaf sample was crushed into pieces and weighed on a techno-chemical scale to determine ascorbic acid.

RESULTS AND DISCUSSION

First of all, the amount of ascorbic acid found in general strengthening vitamins has been studied for feeding and health of animals. The determination method is based on reductive properties of ascorbic acid. Blue 2,6-dichlorphenolindophenol (indicator) is transformed into colorless compounds thanks to plant extracts (Tilmans reaction). Two types of the 2,6-dichlorophenolindophenol reactions exist: as a result of Type 1 reaction, the pH of the environment changes (as in ordinary asymmetric indicators), in which the blue color of the alkaline environment is intensely transmitted to light red of the acidic environment. The color change occurs between pH 4 and pH 5, and the indicator is purple. In the 2nd reaction dark blue color of the indicator becomes colorless. The last reaction is used for the determination of ascorbic acid. The acid extracts are titrated with the indicator until the pink color appears.

Vitamin "C" was found to be 890 mg% in leaves of *Potentilla reptans* L. belonging to the Rosaceae Juss. Family collecting in June, 291 mg% in leaves of *Filipendula vulgaris* Moench., up to 117 mg% in leaves of *Geum urbanum* L., 30 mg% in *Arctium transcaucasicum* DC. leaves belonging to the Asteraceae Dumort. family, 65.8 mg% in leaves of *Pyrethrum leptophyllum* Stev. ex. Bieb., it reaches 50-70% in *Taraxacum officinale* Wigg. leaves, 87.5 mg% in *Telekia spesiosa* Baumg. leaves, 40 mg% in green mass of the *Hieracium umbellatum* L. plant in flowering phase, 180 mg% in leaves of *Rumex confertus* Willd. belonging to the Polygonaceae Juss. family, 50 mg% in *Nepeta grandiflora* Bieb. belonging to the Lamiaceae Lindl. family, in large amount in green leaves of *Bunias orientalis* L. belonging to the Brassicaceae Burneett family. It was defined that there are 173 mg% vitamin "C" in the early flowering phase, in *Galium verum* L. belonging to the Rubiaceae Juss family and 33.5 mg% in the late flowering phase, 108 mg% in leaves of *Campanula rapinculoides* L. belonging to the Campanulaceae Juss. family, 144.5 to 400 mg% in leaves of *Campanula latifolia*.

As you can see, there are enough vitamin C in food ingredients for the feeding of the animals in the summer pastures, it is 6-90% in the Rosaceae family members, but it varies between 2-9% in the other species (Fig. 1).

In the flowering phase of plants, the amount of ash protein, proteins, lubricants and insecticides in various organs was studied and their nutritional value was determined on that basis (Table 1).

As seen in the table, the summer feed, rich in vitamin C, has a high nutritional value of the main feed crops. In addition, the sources of literature (Biologically active., 2001) and the results of our long-term research have been focused on, and full information on the main feed crops of summer pastures has been obtained. Presence of protein and vitamins in the surface part of the *Potentilla reptans*type indicates the quality of the excretion. It is a growing and herbaceous plant. It is eatable as its root splinters contain starch. It was defined that, there is 35% to 45% vaccine preparation in the roots of the genus *Geum rivale* L. species and there is 45% to 48% vaccine preparation in the roots and leaves of the genus *Rumex confertus* Willd.It was defined that there is 5.03% essential oil in *Salvia verticillata* L. flowering phase. V.Khalilov indicates that there is 15.1% vitamin "E" in the plant. (Khalilov, 2012).There is 0.6% essential oil in *Clinopodium vulgare* L. species. Essential oil is obtained from the plant in the flowering and seeding phases. *Nepeta pannonica* L. And *Nepeta grandiflora* Bieb. are plants with essential oil.

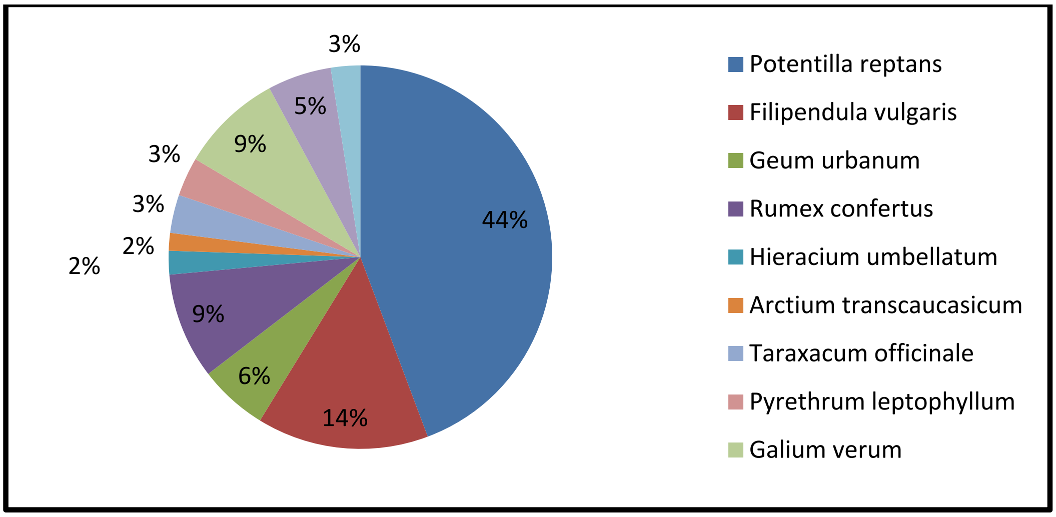


Fig. 1. Determination of Vitamin C in various plants of summer pastures.

Table 1. Chemical composition of feed crops belonging to various grass groups of summer pastures per an absolute dry mass, %.

Herbs	Protein	Nitrogen-free extractivessubstances	Oils	Cellulose	Ash	Flowering phase
Veronica anagillis – aguatica	16.4-17	50	6.6	18.9	6.3	surface part
Hypericum perforatum	12-12.5	57	5	22	4	surface part
Symphytum caucasicum	-	-	3.4-3.5	-	-	surface part
Hesperis matronalis	14-15	43	3-3.12	-	10	surface part
Anthriscus nemorosa	10	45	6-6.21	28	-	surface part
Salvia verticillata	-	-	5.03-5.05	-	-	leaf
Leontodon hispidus	18,6	44.1	3.8	18.8	14.7	surface part
Potentilla reptans	11	54.5	4-4.1	20.45	-	surface part
Galium ruthenicum	10.9	55.2	4	22.7	7.2	leaf
Galium verum	13.8	42	3.5	30.3	10.4	leaf
Galium tenuissimum	13.4-16.7	38.7	4.5	28.1	12	leaf
Arctium transcaucasicum	11.5	4.3	4.1	-	14.4	leaf
Arctium lappa	18.4	43.2	1.5	22.3	14.6	leaf
Achillea millefolium	19-55	41.05	3.90	22.45	13.5	surface part
Taraxacum stevenii	18.7-25.0	-	-	14.8-26.5		leaf
Pimpinella rhodantha	8-9	51	4	29		surface part
Chamaesciadium acaule	14.1	40.8	3.5	28.8	12.8	surface part
Centaurea fischeri	12.3	49.3	3.2	27. 6	8.5	leaf
Campanula tridentata	13.5	51	4.9	20.6	10	surface part
Campanula rapinculoides	11.3	51	-	2.9	9.9	surface part
Heracleum sosnowskyi	16	58	2.6	1.1	11.5	leaf

In summer pastures, animals are fed with all three of these species. It was defined that there is 4.7% oil and 8.7% vitamin “E” in *Heracleum trachyloma* Fish et Mey. species flowering phase. There are large quantities of carbohydrates, proteins, fats, ash compounds (microelements such as copper, magnesium, cobalt, iodine, molybdenum, iron and selenium), vitamins A, C, E in the composition of *Heracleum sosnowskyi* Manden. The calcium content fully meets the zootechnical requirements of feeding. *Arctium transcaucasicum* DC. slightly differs from *Arctium lappa*species for its chemical composition. Acylloid is found in leaves and flowers. There are 75% of inulin, essential oil, gum and spicy substances in the root of the plant. There are alkaloids and essential oil in composition of *Arctium lappa* L. which has a fodder value in its green mass. *Galium ruthenicum* Willd., *Galium tenuissimum* Bieb. and *Galium verum*has have average fodder quality due to 9.8% protein in their composition. *Campanula aucheri* is considered as one of the best fodder plants because of its chemical composition.

In the chemical composition of *Bunias orientalis* L. in flowering phase (absolute dry substance in %): protein 2.5, and it contains fatty oil in seeda. There are 4.2% oil and 16.5% vitamin “E” in the composition of *Alchemilla retinervis* Bus. in flowering phase. There are up to 17% fatty oil or 4-6% essential oils in the seed composition of *Carum carvi* L.. Essential oils consist of ketone-carbon and terpene-limonene. Protein amount is high, especially in leaf composition of *Rumex confertus* Willd., especially it is rich in proteins (91%). *Achillea millefolium* L. collected from a height of 2000 m is an import medical herb, rich in the chemical composition and essential oils in the bubble stage. It must be added to the animal feed ration. *Taraxacum officinale* Wigg. species composition collected in different phases show that, this plant is rich in proteins and oil substances, however the amount of cellulose is low. These figures once again prove the high fodder importance of themedicinal herb. There is spiciness in its leaves, but there is no alcoholoid in its leaves and root. According to some authors, there is alcholoid called teraxine in its root. The amount of protein in *Taraxacum stevenii* DC. composition is 18.7-25.0; and cellulose is less- 14.8-26.5%. *Leontodon hispidus* L. grows very fast after feeding, the chemical analyses show that, this is an important fodder plant in the vegetation phase. It is mentioned that, there is a few alcoholoid in the plant. *Doronicum oblongifolium* DC. chemical composition of leaves and body show that, there are 2.2 times more ash, 2 times more protein, 2.5 times more cellulose in leaves in comparision with body. The amount of oils are the same at both organs of plant (leaf and stem). There are 5.7-5.8% oils in stem and leaves of *Doronicum macrophyllum* Fisch. ex Hornem. as in long doronicum. The analyses of chemical composition of *Centaurea fischeri* Schlecht. collected from subalpine grassy of Dashkasan district show that its composition is fodder important (for absolute dry substance). There are 0.7-0.9% essential oils in baskets of *Pyrethrum leptophyllum* Stev. ex. Bieb. in the flowering phase

and this is used in production of camphor. According to the literature, it was defined that, there is alcholoid in its composition. *Campanula tridentata* and *Campanula rapinculoides* L. are important in term of food. It was noted that, alcholoid is found in leaves and flower groups of *Telekia spesiosa* Baumg. The amount of protein is much in young plants of *Cirsium arvense* (L.) Scop., but the amount of cellulose is less. There are 8.1% protein, 28.4% cellulose, 10% ash, 6.1% oils, 47.4% non-nitrogen extractive substances in the composition of the rough plant. There are vitamins C and A in the composition of *Cirsium arvense* species. There are reports on alcholoid called sirzin in the composition of desert gingival. There is 27.2% fatty oil in seeds of the plant. There are 21.55% protein, 15.95% ash in the leaves and 6.1% protein, 7.6 % ash in the stem of *Cirsium vulgare* (Savi) Ten during the flowering phase.

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Yay Otlaqlarının Müxtəlifot Qrupuna Aid Əsas Yem Bıtkılərının Keyfiyyət Göstəricilərinin Təyini

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Məqalədə Azərbaycanın Kiçik Qafqaz şimalı-şərq rayonlarında və Talış ərazisinin (Masallı, Lənkəran və Yardımlı) yay otlaqlarından toplanılan müxtəlifot yem qrupu bitkilərinin qidalılıq dəyəri barədə məlumat verilmişdir. Tədqiqatlar göstərmişdir ki, «C» vitamini əsasən Rosaceae fəsiləsi nümayəndələrində (6-44%) daha çox müşahidə edilir. Digər fəsilələrin nümayəndələrində (2-9 %) nisbətən azdır. Yay otlaqlarının müxtəlifot qrupuna aid yem bitkilərinin kimyəvi tərkibi mütləq quru kütləyə görə hesablanmışdır. Bitkilərin çiçəkləmə fazasında müxtəlif orqanlarında külün, proteinin, zülalın, yağların və azotsuz ekstraktiv maddələrin miqdarı öyrənilmiş və bu əsasda onların qidalılıq dəyəri təyin edilmişdir.

Açar sözlər: *Yay otlaqları, yem qrupu, kimyəvi tərkib*

Определение Показателей Качества Основных Кормовых Растений, Относящихся к Группе Разнотравья Летних Пастбищ

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В статье представлены данные о пищевой ценности растений кормовой группы разнотравья, собранных в Азербайджане на летних пастбищах северо-восточных районов Малого Кавказа и Талыша (Масаллы, Ленкорань и Ярдымлы). Исследования показали, что витамин «С» чаще встречается у представителей семейства *Rosaceae* (6-44%). У представителей других семейств (2-9%) он выявлен в меньшей степени. Химический состав кормовых культур летних пастбищ, относящихся к разнотравью, рассчитывался на основе абсолютной сухой массы. Количество золы, белков, жиров и безазотистых экстрактивных веществ определяли в фазе цветения в различных органах растений и на основании полученных результатов определялась их пищевая ценность.

Ключевые слова: *Летнее пастбище, кормовая группа, химические свойства*